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MORALITY BEFORE KNOWLEDGE

Preparedness of special needs school communities for earthquakes: A case study in an area with a very high seismicity in Daerah Istimewa Yogyakarta

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ABSTRACT

Background: DIY is a province in Indonesia that is very susceptible to earthquakes. In 2006, a seismic event measuring 6.2 on the moment magnitude scale struck DIY, causing injuries and extensive damage to both the structural and non-structural elements of several buildings, including one in the education sector. The problem of structural damage to educational facilities is a significant worry, especially in school communities that cater to vulnerable children, such as those in special needs schools/*Sekolah Luar Biasa* (SLB), who are more susceptible to harm during disasters. This study aims to assess the level of preparedness and accessibility of the special needs school community located in a very high seismic region of earthquakes in the DIY, in the event of an earthquake. **Methods:** The structural assessment took the form of a binary question, requiring a simple yes or no response. **Findings:** To reduce the risk of earthquakes in the special needs education sector, a review of the preparedness of the special needs school building and community was carried out by implementing "*Satuan Pendidikan Aman Bencana (SPAB)*" or Disaster Safe Education Unit guidelines. The findings suggest that SLB Sekar Melati Muh. Imogiri (78.26) was classed as having moderate earthquake risk, whereas SLB Dharma Bhakti Piyungan (88.55), SLB Insan Mandiri Dlingo (90.29), and SLB Purworaharjo (88.41) featured infrastructure that was rated as very vulnerable. With respect to SLB Dharma Bhakti Piyungan (64.52), SLB Insan Mandiri Dlingo (60.11), and SLB Purworaharjo (76.94), their average community readiness index scores put them in the intermediate capability category for earthquake preparedness. SLB Sekar Melati Muhmmadiyah Imogiri, however, was categorized as having a low capacity for earthquake readiness with an average index score of 56.92 for community preparedness. **Conclusion:** special needs school communities should raise their level of preparedness by undertaking seismic socialization and regular simulations to boost the community's understanding of earthquakes and reduce the likelihood of harm following an earthquake. **Novelty/Originality of this Study:** The study breaks new ground by assessing earthquake preparedness and accessibility in special needs schools within a high-seismicity region, addressing a critical gap in disaster risk reduction for vulnerable populations.

KEYWORDS: earthquake; inclusive; preparedness; special needs school.

1. Introduction

The Special Region of Yogyakarta/*Daerah Istimewa Yogyakarta* (DIY), a province in Indonesia, has a significant risk of earthquakes due to its geographical location along the Opak Fault, a geological feature that runs from southwest to northeast (Widjajanti et al., 2021). According to the Indonesia Ministry of Energy and Mineral Resources (2023), a total of nine destructive earthquakes have been documented in the DIY region, one of the

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events occurring in May 2006, registering a magnitude of 6.2 Mw. This event resulted in casualties (5.700 people) as well as both structural and non-structural damage (Widayat et al., 2024). In addition to casualties, the disaster had a severe impact on education particularly by the extensive damage sustained by buildings (Sulistyaningrum in Shidiqi et al., 2023).

This impact poses a significant risk in SLB, as there are children who belong to vulnerable communities and face various limitations (Ronoh et al., 2015). According to Mann et al. (2021), children with special needs experience a greater degree of exposure to disasters, yet possess a lower level of ability to cope with disasters. Likewise, a study by Chen et al. (2022) argues that a significant proportion of students with special needs, approximately 30%, experienced adverse effects in the event of a disaster. As reported by Aji (2017), the earthquake in 2006 had a significant impact on a considerable number of special needs schools in DIY, with at least 25 out of 79 schools being affected. Thus, it is crucial to prioritize students with special needs as a vulnerable community in society (BNPB, 2012). With regard to the SPAB National Secretariat Data (2019), a total of 8,730 schools were impacted by earthquakes between 2009 and 2018. Among these schools, 1% were specifically designated as Special Needs Schools.

In general, people with special needs are people with the lowest capacity level when a disaster occurs (Santoso in Winarno et al., 2021). However, people with special needs are still often left out or forgotten in policy-making related to disaster management (Probosiwi, 2013). Therefore, many people are confused and have difficulty evacuating people with special needs. Consequently, staff members and teachers at special needs schools are essential in helping kids with special needs evacuate their buildings safely during an earthquake (Dwiyanti et al., 2022). This means that to properly evacuate both themselves and their students, staff members, and teachers must have a full understanding (Chen et al., 2022).

To reduce the damage caused by earthquakes, not only the capacity of the special needs school communities must be improved but also the structural aspects of special needs school buildings must also be reviewed. One of the efforts that can be made is to implement "*Satuan Pendidikan Aman Bencana* (*SPAB*)" or Disaster Safe Education Unit guidelines, what was previously known as "*Sekolah Siaga Bencana* (*SSB*)" or Disaster Preparedness School guidelines. These guidelines aim to provide education and sharpen the capacity of the special needs school community facing disaster potential in the future (Ramadhani et al., 2020).

Anisah and Sumarni (2019) indicate that SSB encompasses three key pillars: secure school facilities, effective disaster management, and comprehensive education on disaster prevention and risk reduction. The aim is to create a safe environment for the school community, protecting against potential future threats. The three key pillars are used as a guideline in making a structural and non-structural assessment (Ronggowulan et al., 2023). When it comes to implementing Disaster Safe Education Unit guidelines in special needs schools, the responsibility falls on the teachers and employees to ensure the safety of the students (Barus & Aminah, 2021). They must be on guard in safeguarding and instructing the students to evacuate to safe locations during the possibility of a disaster. By implementing the Disaster Safe Education Unit guidelines, this research aims to know the vulnerability level of the SLB buildings through structural assessment and to know the capacity level of SLB communities through non-structural assessment.

2. Methods

2.1 Location

This research was carried out at special needs schools (SLB) in a very high earthquake seismicity region in DIY. The assessment of the earthquake's seismicity zone is reviewed based on the S_s and S_1 values (Khan et al., 2019). The S_s and S_1 values obtained from the

RSA Ciptakarya page (Rosyidah et al., 2023). The S_s and S_1 values are categorized according to the classification of the earthquake's seismicity region. According to data from the Education and Sports Department of DIY (2023), there are a total of 81 special needs schools in DIY, with four of them situated in areas with a very high earthquake seismicity region. Table 1 displays the special needs schools situated in a very high earthquake seismicity region in DIY.

Table 1. Special needs schools located in very high earthquake seismicity regions in DIY

No	School name	City	S_s	S_1	Seismicity region
1	SLB Dharma Bhakti Piyungan	Bantul	1.563	0.660	Very high
2	SLB Insan Mandiri Dlingo	Bantul	1.555	0.629	Very high
3	SLB Sekar Melati Muh. Imogiri	Bantul	1.512	0.633	Very high
4	SLB Purworaharjo	Gunungkidul	1.539	0.681	Very high

2.2 Disaster safe education unit guidelines

There are three main pillars of Disaster Safe Education Unit guidelines, which are safe school facilities, disaster management in school, and education on disaster prevention and risk reduction in school (Nugraheni, 2023). The three pillars are shown in Figure 1. These three pillars are used as guidelines in assessing school structural and non-structural (community) components. In implementing Disaster Safe Education Unit guidelines, the LIPI Geotechnology Research Centre (2013) monitored the preparedness of the school community.

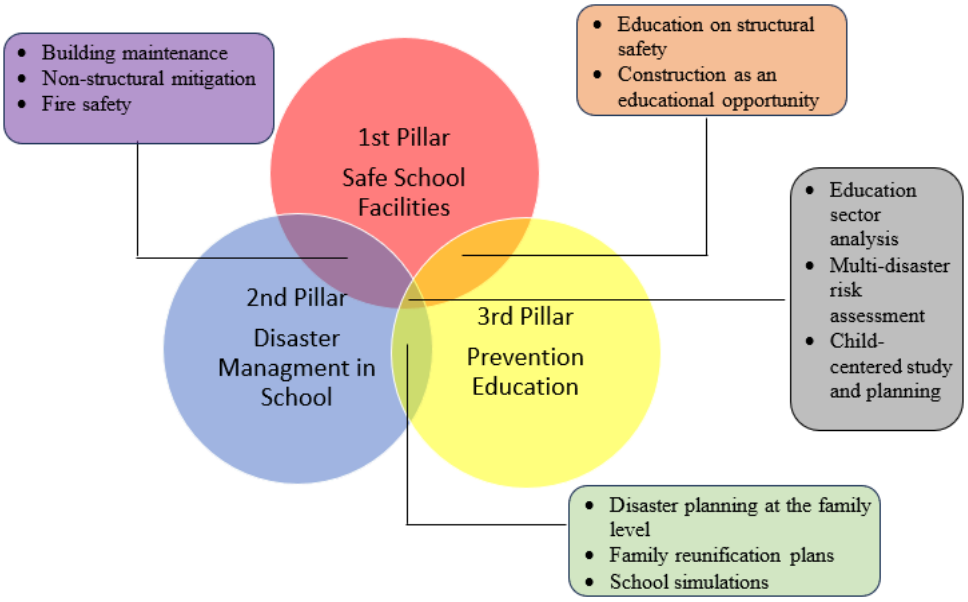


Fig. 1. Three main pillars Satuan Pendidikan Aman Bencana
(Ministry of Education and Culture of the Republic of Indonesia & UNICEF, 2015)

An evaluation was conducted to assess the structural integrity of the school building and determine the level of vulnerability involved, which was conducted autonomously before a subsequent evaluation by a specialist. This assessment serves as a reference for the school to evaluate the susceptibility of the building to potential disaster risks that may be encountered. An evaluation of school structural components involves examining various aspects of facilities and infrastructure (National Secretary of SPAB, 2019a). Four parameters were then used to assess structural components: structural, architectural, furniture and contents, and other supporting equipment (Roi et al., 2023). The questionnaire of the structural assessment could be assessed through the Disaster Safe

Education Unit guideline. The structural assessment took the form of a binary question, requiring a simple yes or no response. This questionnaire included inquiries concerning the four factors outlined in Table 2. Each affirmative response was awarded one point per question. Table 2 provides the necessary information to determine the index score of the parameters, as seen in Table 2. By utilizing the number of affirmative responses obtained from the questionnaire, the readiness index score for the structural components might be computed using Equation 1.

Furthermore, the special needs school community implemented a non-structural assessment to assess their capacity level for facing an earthquake (Triyono et al., 2013). The special needs school community is composed of headmasters, teachers, employees, students, and school committees. Triyono et al. (2013) in Fakhurrozi (2021) have identified five critical parameters that constitute the evaluation of non-structural aspects: policies and guidelines, knowledge and attitudes, emergency response plans, disaster warning systems, and resource mobilization. The KAP Survey was the result of the reduction of the five parameters to three: Knowledge, Attitude, and Practice (KAP). Similar to the structural questionnaire, the community assessment questionnaire included a yes/no question in the KAP survey. The yes/no responses received one point for each query, dependent upon whether the response was positive or negative (Akhirianto et al., 2020). Table 3 displays the total number of questions in the KAP survey, with a varying number of questions for each community. Table 4 illustrates the calculation of the community's index score, as provided by Table 3. In this manner, the preparedness index score of special needs school communities could be determined by tallying the number of yes or no responses using Equation 1.

2.3 Vulnerability and capacity index score

The school's preparedness level was assessed by conducting a KAP Survey to know the capacity level of the communities and evaluating the school infrastructure to know the vulnerability level of the buildings as part of the implementation of Disaster Safe Education Unit guidelines. Table 2 displays the questions and index scores used to assess infrastructure.

Table 2. Scoring parameters and index score of school infrastructure

No	Code	Parameter	Number of questions	Index score
1	300	Structural (S)	10	22
2	400	Architectural (A)	12	26
3	500	Furniture and contents (Pi)	15	33
4	600	Other supporting equipment (Pp)	6	19
		Total		100

(Triyono et al., 2013)

A KAP Survey was administered among various stakeholders in school communities, including headmasters, teachers, employees, students, and school committees. Each category was assessed with a specific set of questions and assigned index scores. Table 3 and Table 4 demonstrate the questions and index scores of the KAP survey.

Table 3. Number of questions of the KAP survey

No	Category	Knowledge (K)	Attitude (A)	Practice (P)	Total
1	Headmaster	13	11	16	40
2	Teacher	13	8	14	35
3	Student	9	2	2	13
4	School committee	14	6	5	25

(Triyono et al., 2013)

Table 4. An index score of the KAP survey

No	Category	Knowledge (IK)	Attitude (IA)	Practice (IP)	Total
1	Headmaster	33	28	40	100
2	Teacher	37	23	40	100
3	Student	70	15	15	100
4	School committee	56	24	20	100

(Triyono et al., 2013)

According to the data presented in Tables 2 to 5, the score for the preparedness index of school infrastructure and the special needs school community could both be determined using Equation 1.

$$The\ preparedness\ index\ score\ =\ \sum_i Index\ score_i \frac{Score_i}{Questions_i} \quad \text{(Eq.1)}$$

Table 5. School preparedness categories

Index Score	Preparedness category
80 – 100	High preparedness
60 – 79	Moderate preparedness
< 60	Low preparedness

(Triyono et al., 2013)

The preparedness index score was calculated to categorize the level of preparedness of the school community and infrastructure into three categories, as illustrated in Table 5. According to Table 5, if the structural assessment's level of preparedness was received as high, the building would be less vulnerable to an earthquake. On the other hand, if the structural assessment's level of preparedness was classified as low, it indicates that the building was highly vulnerable to earthquakes. In addition, a high preparedness score from the non-structural assessment shows a high capacity of the school community. On the one hand, a low preparedness score from the non-structural assessment shows a low capacity of the school community.

3. Results and Discussion

3.1 SLB Dharma Bhakti Piyungan

SLB Dharma Bhakti Piyungan consists of 3 main buildings, which are the North Building, the West Building, and the South Building. Table 7 illustrates the evaluation of the school infrastructure at SLB Dharma Bhakti Piyungan. According to the evaluation in Table 6, SLB Dharma Bhakti Piyungan's infrastructure received an average preparedness index score of 88.55.

Table 6. The assessment of the school infrastructure of SLB Dharma Bhakti Piyungan

No	Buildings	Structural (S)	Architectural (A)	Furniture and contents (Pi)	Other supporting equipment (Pp)	Score	Category
1	South building	9.00	8.00	12.00	4.00	87.39	High
2	West building	9.00	8.00	11.00	5.00	86.09	High
3	North building	10.00	10.00	10.00	6.00	92.17	High

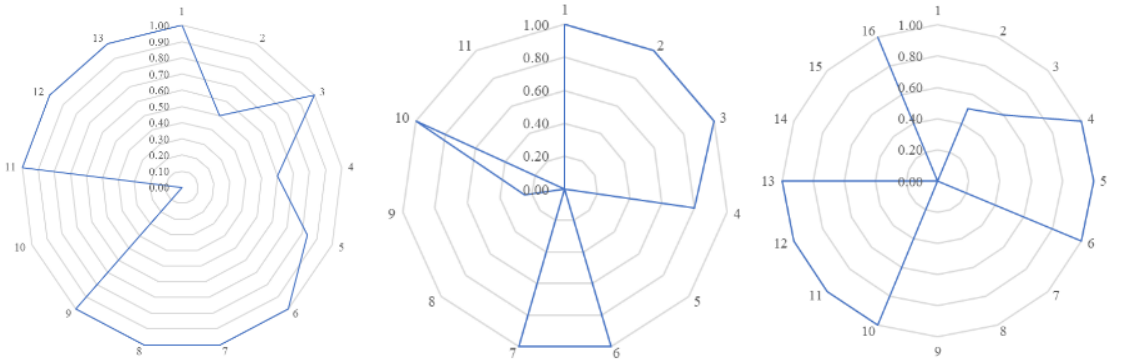
The construction of SLB Dharma Bhakti Piyungan demonstrated a high level of resilience in the face of earthquakes which means that SLB Dharma Bhakti Piyungan's school building has a low level of vulnerability in facing an earthquake (National Secretary of SPAB, 2019a). Nevertheless, there were areas in SLB Dharma Bhakti Piyungan that could

benefit from improvement. These include addressing cracked walls, ensuring the secure attachment of hanging objects, implementing roof tile support to reduce the risk of tiles falling during earthquakes, and repairing any cracked flooring (Figure 2).

a) b) c)

Fig. 2. a) Cracked wall, b) Fan not properly attached, c) Cracked floor

The evaluation of the community capacity of SLB Dharma Bhakti Piyungan was performed by a group consisting of the school headmaster, teacher, and staff (totaling 9 individuals), as well as students (totaling 12 individuals), and the school committee (totaling 14 individuals). The answer to the SLB Dharma Bhakti Piyungan's community capacity was plotted on a rose diagram shown in Figure 3 until Figure 6.



a) b) c)

Fig. 3. The rose diagram of the Headmaster of SLB Dharma Bhakti Piyungan's community capacity answers a) Knowledge, b) Attitude, c) Practice

Figure 3 shows that the headmaster of SLB Dharma Bhakti Piyungan lives in an earthquake-prone area (question 10). Based on the attitude questionnaire, SLB Dharma Bhakti Piyungan has taught the students about disaster (definition, disaster events, and how to evacuate), but the competency standard, syllabus, and evaluation have not been made. Other than that, SLB Dharma Bhakti Piyungan has never been assisted by the institution in preparedness efforts. SLB Dharma Bhakti Piyungan has already carried out an evacuation simulation once but still has no evacuation procedure.

Figure 4 shows that 33% of the teachers and the employees in SLB Dharma Bhakti Piyungan live in earthquake-prone zones. All of the teachers and the employees said that they know about natural disasters, but only 53% of them could answer correctly about the definition of natural disasters. Based on the attitude surveys, 67% of the teachers and the employees have included disaster material in class, but only 44% of them have already made syllabi, competency standards, and evaluations. The practice survey said that SLB Dharma Bhakti Piyungan has a disaster preparedness team, but only 44% of teachers and employees know about it, and only half of them joined the team.

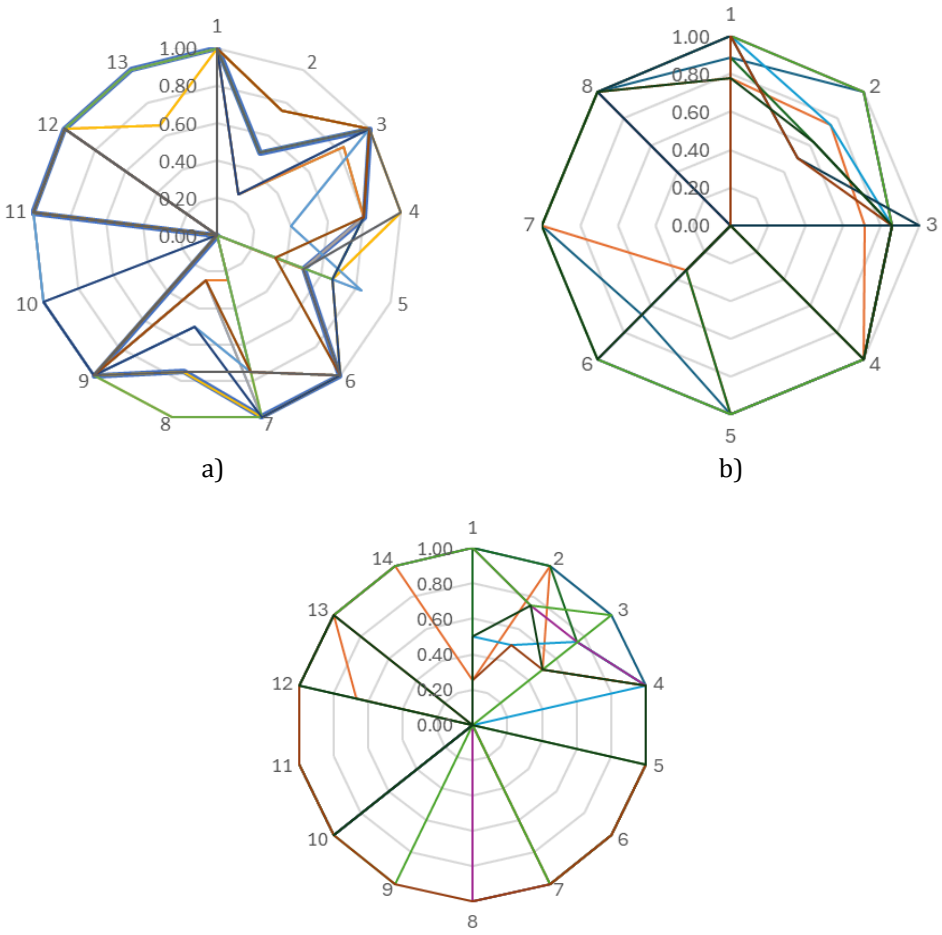


Fig. 4. The rose diagram of the teachers and employees of SLB Dharma Bhakti Piyungan's community capacity answers a) Knowledge, b) Attitude, and c) Practice

According to Figure 5, 83% of the students in SLB Dharma Bhakti Piyungan have learned about earthquakes before, but only half of them have learned about tsunamis. Additionally, 92% of the students in SLB Dharma Bhakti Piyungan know the definition of natural disaster, but only 38% could mention the disaster that was caused by the earthquake. Furthermore, 46% of the students know how to increase their preparedness for facing earthquakes and know what are the sources that give information about disasters.

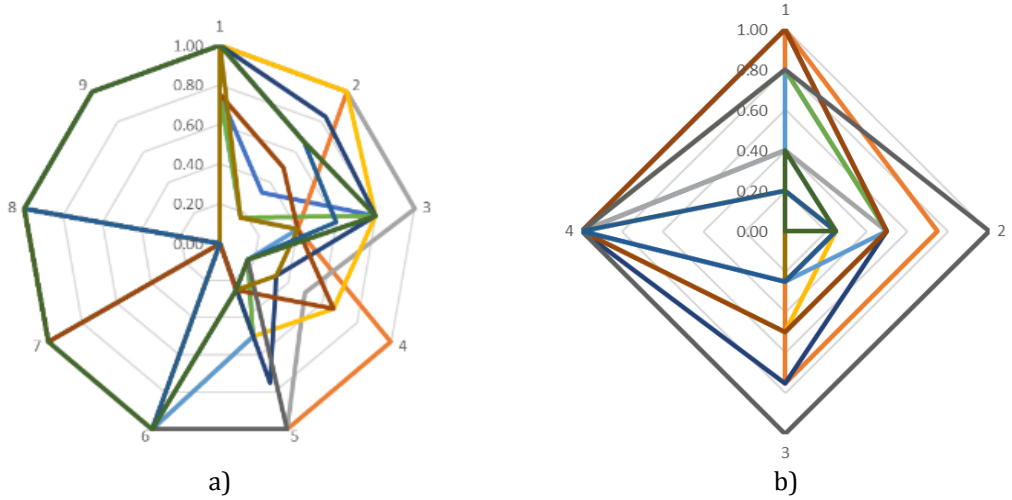
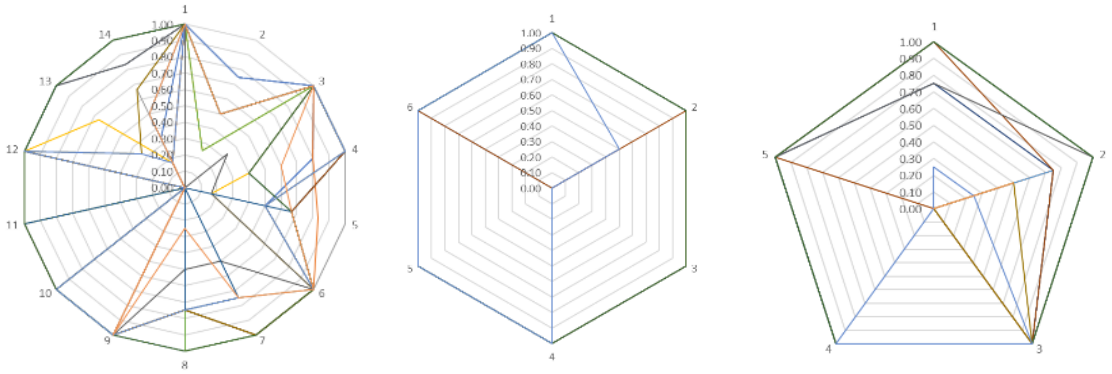


Fig. 5. The rose diagram of the students of SLB Dharma Bhakti Piyungan's community capacity answers a) Knowledge, b) Attitude and practice

According to Figure 6, 45% of the SLB Dharma Bhakti Piyungan's school committees have joined disaster preparedness training before. The result of the attitude and the practice survey in SLB Dharma Bhakti Piyungan shows that the average score of each question is below 50%, it shows that the discussion about disaster preparedness in school is only carried out by some of the committees.



a) b) c)

Fig. 6. The rose diagram of the school committees of SLB Dharma Bhakti Piyungan's community capacity answers a) Knowledge, b) Attitude, c) Practice

SLB Dharma Bhakti Piyungan's average community preparedness index score was determined, and it is shown in Table 8. According to Table 8, the headmaster, teachers, employees, and school committees of SLB Dharma Bhakti Piyungan were considered to have moderate capacity when facing an earthquake with preparedness index scores 67.17, 70.18, and 61.34 respectively (Nurfalaq et al., 2023). On the other hand, the students of SLB Dharma Bhakti Piyungan were classified as having a low capacity when facing an earthquake with a preparedness index score of 61.34.

Table 7. The assessment of community capacity of SLB Dharma Bhakti Piyungan

No	Category	Average preparedness index score	Preparedness category
1	Headmaster	67.71	Moderate
2	Teacher and employee	70.18	Moderate
3	Student	59.85	Low
4	School committee	61.34	Moderate

3.2 SLB Insan Mandiri Dlingo

SLB Insan Mandiri Dlingo consists of three primary buildings: the north building, used as a classroom; the east building, serving as a prayer room, cafeteria, and library; and the east-south structure, designated for the teaching room and hall. Table 8 shows the evaluation of the school infrastructure of SLB Insan Mandiri Dlingo.

Table 8. The assessment of the school infrastructure of SLB Insan Mandiri Dlingo

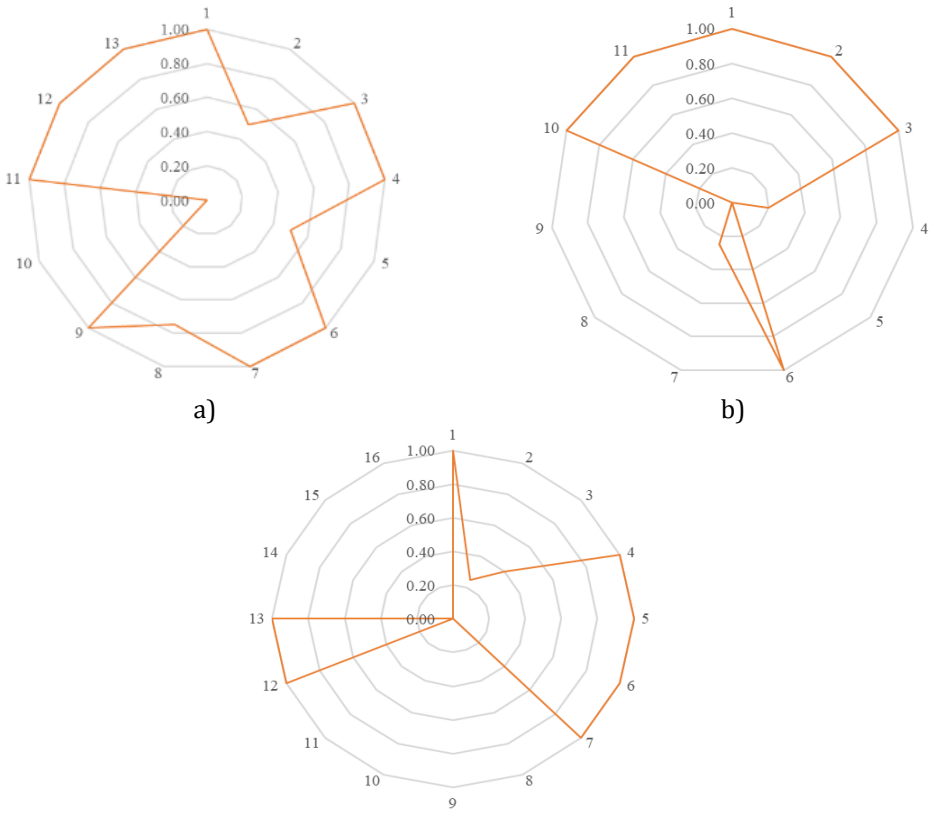
No	Buildings	Structural (S)	Architectural (A)	Furniture and contents (Pi)	Other supporting equipment (Pp)	Score	Category
1	North building	8.00	11.00	11.00	6.00	93.70	High
2	East building	8.00	9.00	9.00	6.00	81.96	High
3	East-South building	9.00	9.00	13.00	5.00	95.22	High

The infrastructure of SLB Insan Mandiri Dlingo received an average preparedness index score of 90.29, indicating that the school building is well-equipped to handle earthquakes (Ruslanjari et al., 2024). This means that the buildings in SLB Insan Mandiri Dlingo have a low vulnerability to facing an earthquake. Thus, several areas of the school require restoration, including the damaged walls and floors, the acquisition of a fire extinguisher, and the replacement of missing roof tiles. Figure 7 displays the information.

a) b) c)

Fig. 7. a) Cracked floor, b) Cracked wall, c) Losing roof tiles

An assessment was carried out to determine the capacity of the SLB Insan Mandiri Dlingo community. The evaluation team comprised the school headmaster, teachers, and staff (a total of 7 individuals), along with students (a total of 12 individuals), and the school committee (a total of 5 individuals). The answer to the SLB Insan Mandiri Dlingo's community capacity was plotted on the rose diagram shown in Figure 8 until Figure 11.



a) b)

c)

Fig. 8. The rose diagram of the Headmaster of SLB Dharma Bhakti Piyungan's community capacity answers a) Knowledge, b) Attitude, c) Practice

The attitude survey result in SLB Insan Mandiri Dlingo shows that these special needs schools have not implemented the policy of disaster preparedness in the school. Other than

that, SLB Insan Mandiri Dlingo has never been assisted by the institution in disaster preparedness efforts. The practice survey result shows that SLB Insan Mandiri Dlingo doesn't have disaster evacuation procedures.

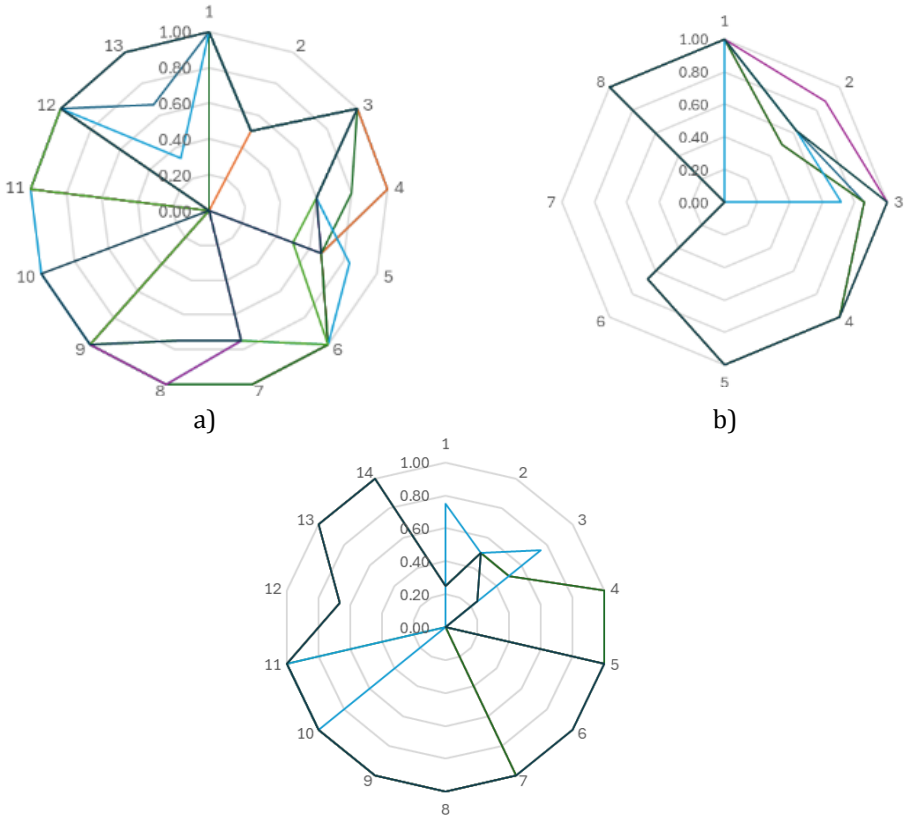


Fig. 9. The rose diagram of the teachers and employees of SLB Insan Mandir Dlingo's community capacity answers a) Knowledge, b) Attitude, c) Practice

According to Figure 9, all of the teachers and the employees in SLB Insan Mandiri Dlingo know about the disaster. Additionally, 71% of the teachers and employees live in the earthquake-prone zone. However, 57% of the teachers and employees have participated in disaster preparedness training. The attitude survey in these SLBs showed that 57% of SLB Insan Mandiri Dlingo's teachers and employees have taught their students about disaster preparedness, but none of them have made a competency standard, syllabus, or evaluation program. Meanwhile, the practice survey shows that SLB Insan Mandiri Dlingo got 32% for the evacuation plan. It's because SLB Insan Mandiri Dlingo only has a meeting point at their school.

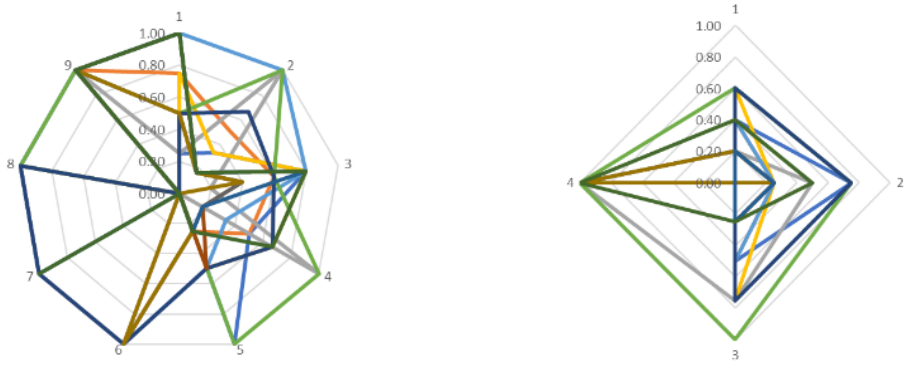
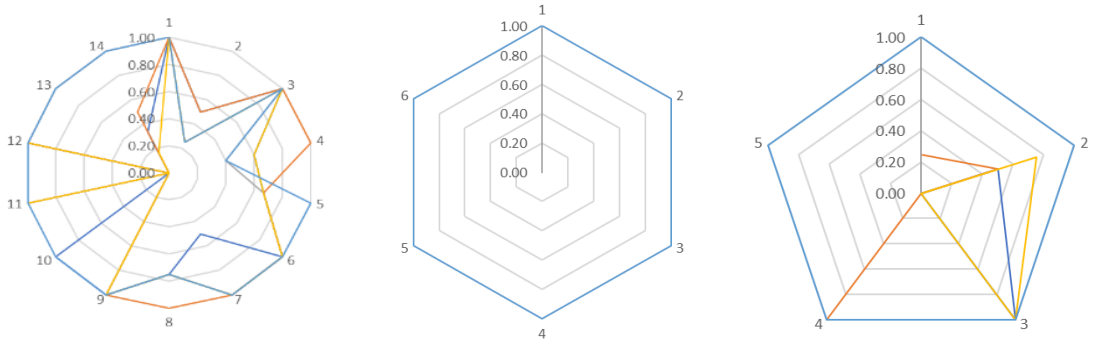


Fig. 10. The rose diagram of the students of SLB Insan Mandiri Dlingo's community capacity answers a) Knowledge, b) Attitude and practice

According to Figure 10, only 58% of SLB Insan Mandiri Dlingo's students feel that they used to learn about earthquakes. 42% of the students answered that earthquakes are unpredictable.



a) b) c)

Fig. 11. The rose diagram of the school committees of SLB Insan Mandiri Dlingo's community capacity answers a) Knowledge, b) Attitude, c) Practice

According to Figure 11, two of the five committees have been doing disaster preparedness training before. The results of the attitude and practice surveys show that only a few of the committee are discussing with the school about disaster preparedness in facing earthquakes. Based on the result of a KAP survey carried out by the SLB Insan Mandiri Dlingo communities, the evaluation results are presented in Table 9. Based on the research results, it was determined that the headmaster, teachers, and employees of SLB Insan Mandiri Dlingo with preparedness index scores 62.13 and 71.58 were found to be somewhat moderate capacity in the event of an earthquake (Ruslanjari et al., 2024). On the other hand, the students and school committee were considered to have a low level of capacity when facing an earthquake, as indicated by index scores less than 60 (Utariningsih et al., 2021).

Table 9. The assessment of community capacity of SLB Insan Mandiri Dlingo

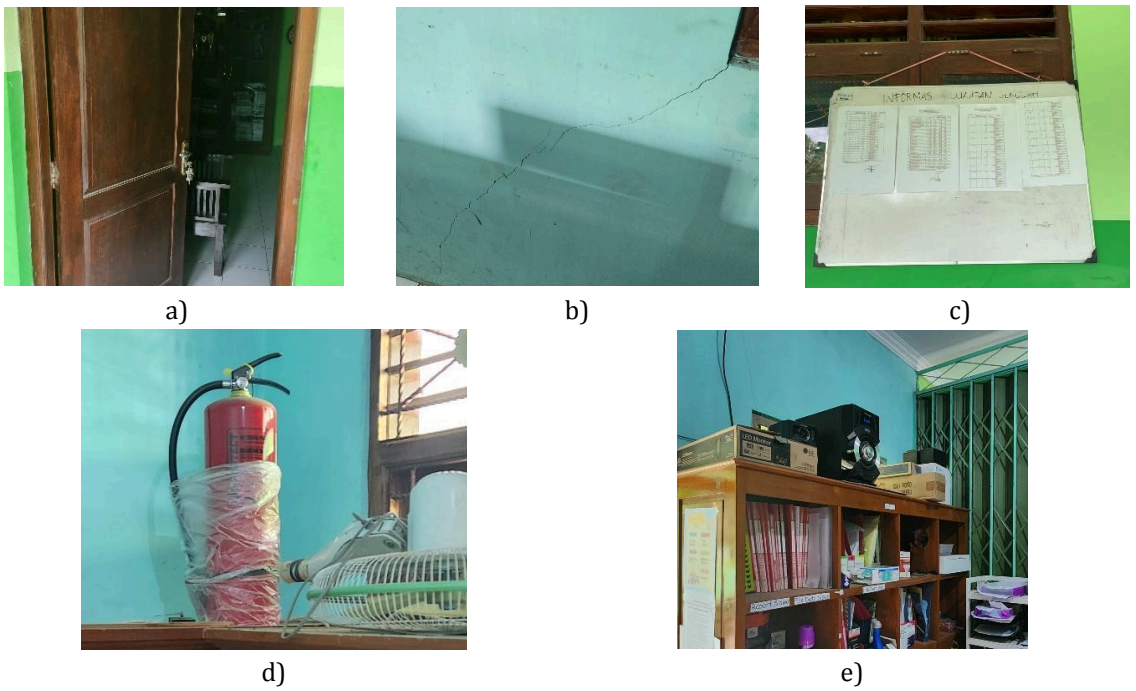
No	Category	Average preparedness index score	Preparedness category
1	Headmaster	62.13	Moderate
2	Teacher and employee	71.68	Moderate
3	Student	49.90	Low
4	School committee	56.73	Low

Based on the research results, it was determined that the headmaster, teachers, and employees of SLB Insan Mandiri Dlingo with preparedness index scores 62.13 and 71.58 were found to be somewhat moderate capacity in the event of an earthquake (Ruslanjari et al., 2024). On the other hand, the students and school committee were considered to have a low level of capacity when facing an earthquake, as indicated by index scores less than 60 (Utariningsih et al., 2021).

3.3 SLB Sekar Melati Muhammadiyah Imogiri

The SLB Sekar Melati Muhammadiyah Imogiri features a single main structure. SLB Sekar Melati Muhammadiyah Imogiri's infrastructure received the following assessment scores: 9.00 (structural), 8.00 (architectural), 8.00 (furniture and contents), and 6.00 (other supporting equipment). The infrastructure had an index score of 78.26, putting it in the moderate range for vulnerability in facing an earthquake according to the ratings (Roswanto, 2022). Nonetheless, some locations needed renovation, including the door

opening, cracked walls, correct fire extinguisher storage, ensuring safe attachment of hanging items, and securing commodities within and on top of the cabinet (Figure 12).

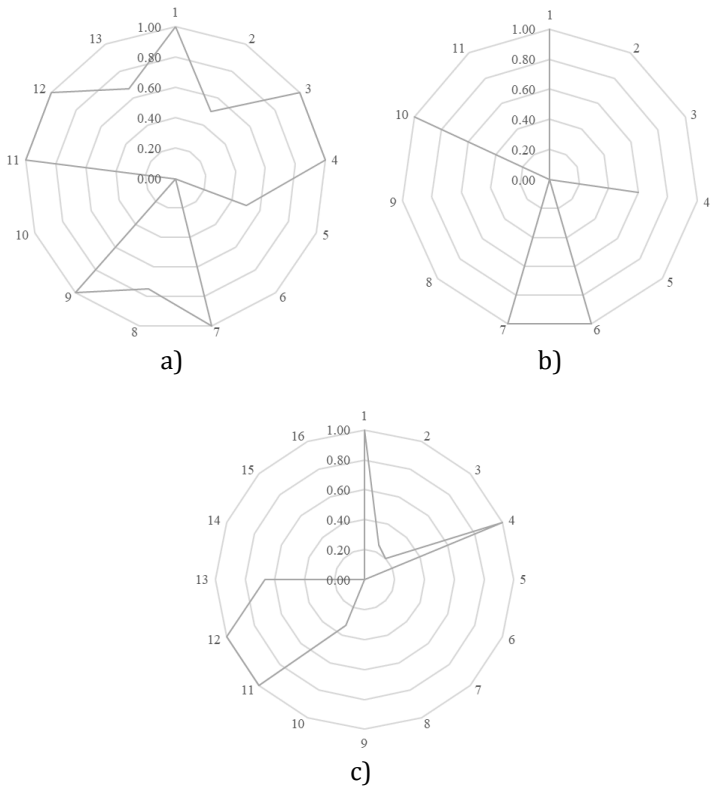


a) b) c)

d) e)

Fig. 12. a) Door opening inward, b) Wall cracked, c) Object tied to one point, d) Fire extinguisher on top of the cupboard, e) Objects inside and on top of the cupboard not secured properly

The assessment of SLB Sekar Melati Muhammadiyah Imogiri community capacity was carried out by the school headmaster, teachers, and employees (6 people), students (9 people), and the school committee (12 people). Based on the KAP survey in SLB Sekar Melati Muhammadiyah Imogiri, a rose diagram was created as in Figure 13 until Figure 16.

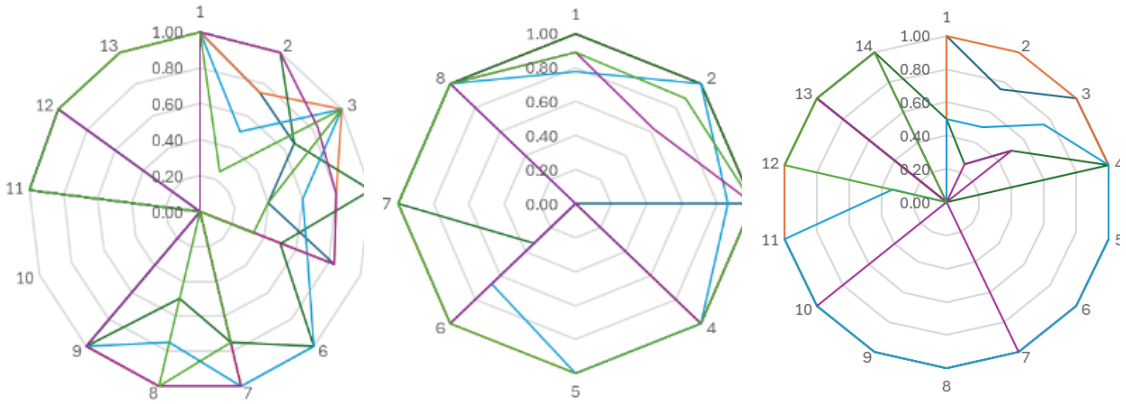


a) b)

c)

Fig. 13. The rose diagram of the Headmaster of SLB Sekar Melati Muhammadiyah Imogiri's community capacity answers a) Knowledge, b) Attitude, c) Practice

According to Figure 13, the knowledge survey shows that SLB Sekar Melati Muhammadiyah Imogiri's headmaster has participated in disaster preparedness training. However, the attitude survey shows that SLB Sekar Melati Imogiri has a warning sign, but the warning sign has never been examined.

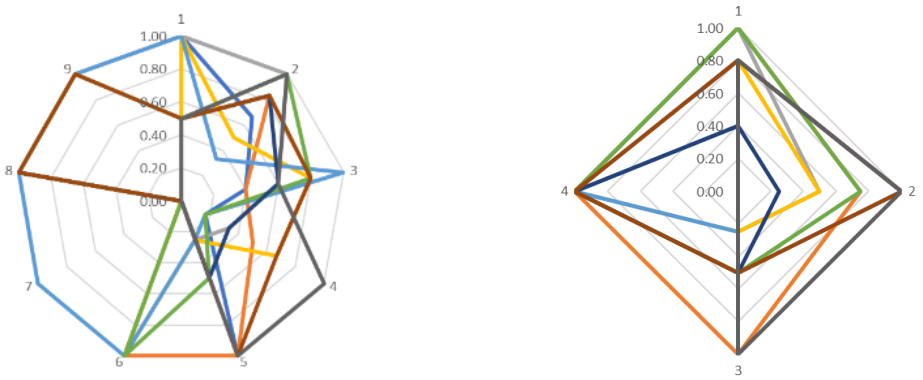


a) b) c)

Fig. 14. The rose diagram of the teachers and employees of SLB Sekar Melati Muhammadiyah Imogiri's community capacity answers a) Knowledge, b) Attitude, c) Practice

According to Figure 14, the knowledge survey shows that all of the teachers and employees in SLB Sekar Melati Muhammadiyah Imogiri live in earthquake-prone zones. 33% of the teachers know that not all earthquake events caused a tsunami, and 50% of teachers and employees in this school have participated in disaster preparedness training. The attitude survey of SLB Sekar Melati Muhammadiyah Imogiri's teachers and employees shows that 98% of the teachers and the employees know what to do when an earthquake occurs while they are teaching. 83% of the teachers and the employees have taught their students about disasters before, and 67% of them made the syllabus, competency standard, and evaluation. However, the practice survey shows that 50% of the teachers and employees said that SLB Sekar Melati Muhammadiyah Imogiri has an evacuation plan.

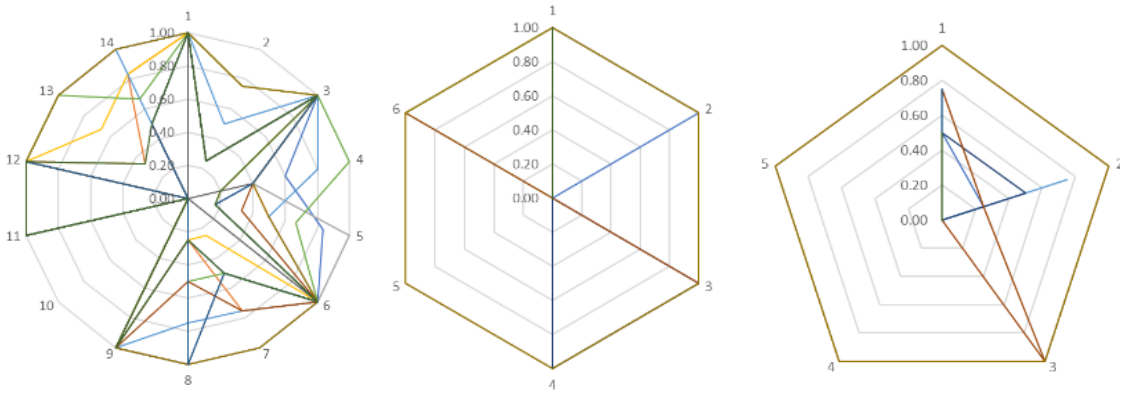
According to Figure 15, the knowledge survey shows that only 11% of the students in SLB Sekar Melati Muhammadiyah Imogiri know that not every earthquake could cause a tsunami. 78% of the students have been discussing the earthquake with people surrounding them, but only 44% of them have been discussing the tsunami with their surroundings. However, the attitude and practice survey shows that 78% of the students in SLB Sekar Melati Muhammadiyah Imogiri know what to do when an earthquake occurs and 64% of the students know what they have to do to increase their disaster preparedness.



a) b)

Fig. 15. The rose diagram of the students of SLB Sekar Melati Muhammadiyah Imogiri's community capacity answers a) Knowledge, b) Attitude and practice

According to Figure 16, the knowledge survey shows that 100% of SLB Sekar Melati Muhammadiyah Imogiri's committee said that they know about natural disasters, but only 40% of them could correctly mention the definition of natural disaster. 44% of the school committee answered that they have participated in disaster preparedness training before. However, the attitude and practice survey results show that less than 50% of the school committees have participated in disaster preparedness discussions with school members.



a) b) c)

Fig. 16. The rose diagram of the school committees of SLB Sekar Melati Muhammadiyah Imogiri's community capacity answers a) Knowledge, b) Attitude, c) Practice

The result of the KAP survey by SLB Sekar Melati Muhammadiyah Imogiri is shown in Table 10. According to Table 10, the teachers, employees, and students of SLB Sekar Melati Muhammadiyah Imogiri were rated as having moderate capacity in their response to an earthquake, but the headmaster and school committee's capacity was categorized as low (Roswanto, 2022).

Table 10. The assessment of community capacity of SLB Sekar Melati Muh. Imogiri

No	Category	Average preparedness index score	Preparedness category
1	Headmaster	48.67	Low
2	Teacher and employee	68.53	Moderate
3	Student	60.47	Moderate
4	School committee	50.01	Low

3.4 SLB Purworaharjo Gunungkidul

SLB Purworaharjo Gunungkidul has some buildings categorized as Building 1 (teacher room, headmaster room, and music studio), Building 2 (class and library), and Building 3 (practice room). Based on the classification, the assessment of the school infrastructure of SLB Purworaharjo Gunungkidul is shown in Table 11.

Table 11. The assessment of the school infrastructure of SLB Purworaharjo Gunungkidul

No	Buildings	Structural (S)	Architectural (A)	Furniture and contents (Pi)	Other supporting equipment (Pp)	Score	Category
1	Building 1	7.00	9.00	9.00	8.00	83.70	High
2	Building 2	8.00	9.00	9.00	9.00	87.83	High
3	Building 3	8.00	10.00	10.00	9.00	93.70	High

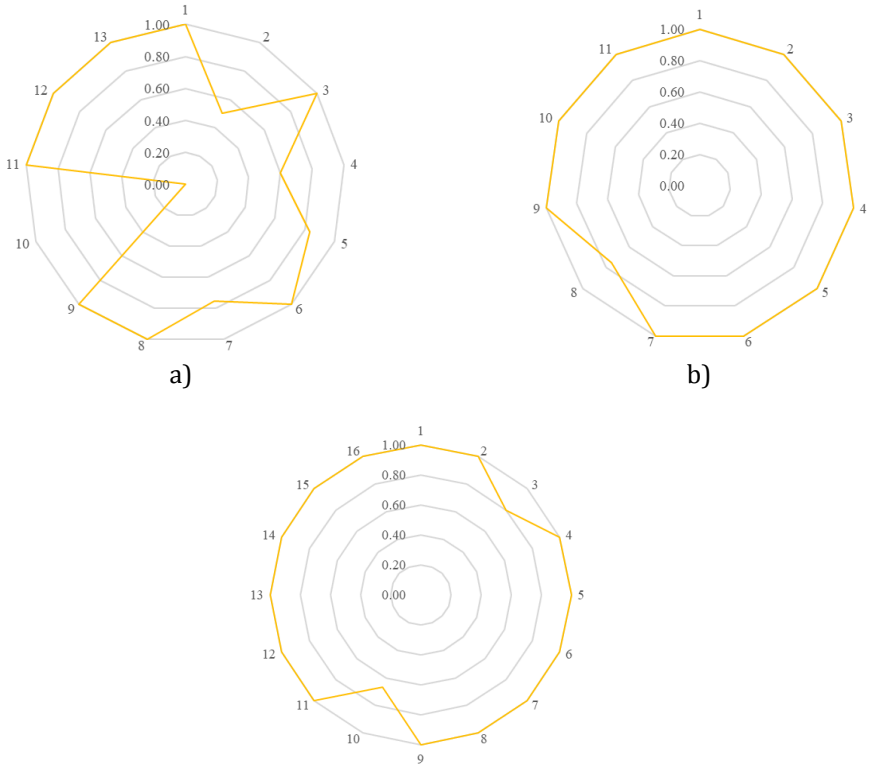
Table 11 shows that SLB Purworaharjo Gunungkidul's infrastructure had an average preparedness index score of 88.41. This indicates that taken as a whole, the structural

component's preparedness of SLB Purworaharjo Gunungkidul was considered high (Ruslanjari et al., 2024). However, this means that the vulnerability of the SLB Purworaharjo Gunungkidul's building was categorized as low. Despite having a high-class facility, SLB Purworaharjo Gunungkidul could use some renovation, like fixing the fractured classroom wall in Figure 17.

a) b) c) d)

Fig. 17. Cracked in class walls a) Inside 1st class, b) Inside 2nd class, c) Outside 1st class, d) Outside 2nd class

The assessment of the SLB Purworaharjo Gunungkidul community capacity was carried out by the school headmaster, teachers and employees (8 people), students (8 people), and the school committee (9 people). Based on the assessment using the KAP survey in SLB Purworaharjo Gunungkidul, a rose diagram was created as in Figure 18 until Figure 21.



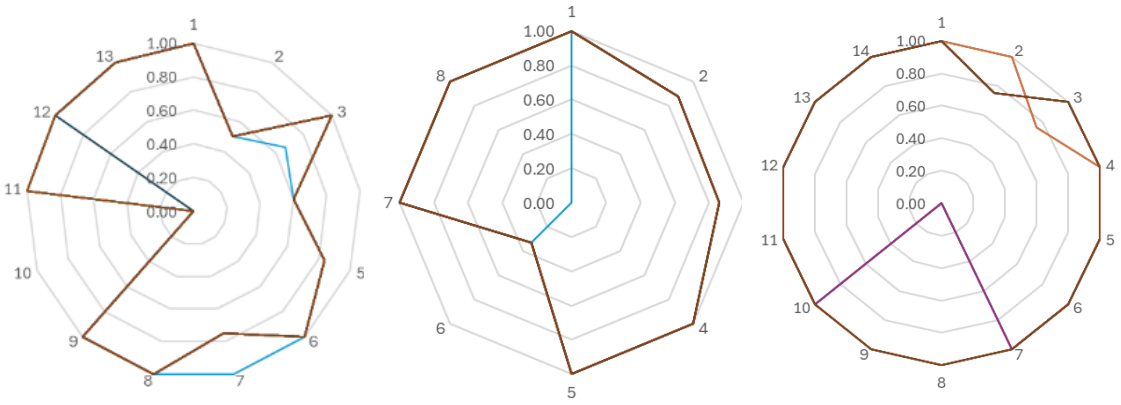
a) b)

c)

Fig. 18. The rose diagram of the Headmaster of SLB Purworaharjo Gunungkidul's community capacity answers a) Knowledge, b) Attitude, c) Practice

According to Figure 18, the SLB Purworaharjo Gunungkidul's headmaster lives in an earthquake-prone zone. Other than that, SLB Purworaharjo Gunungkidul has been assisted

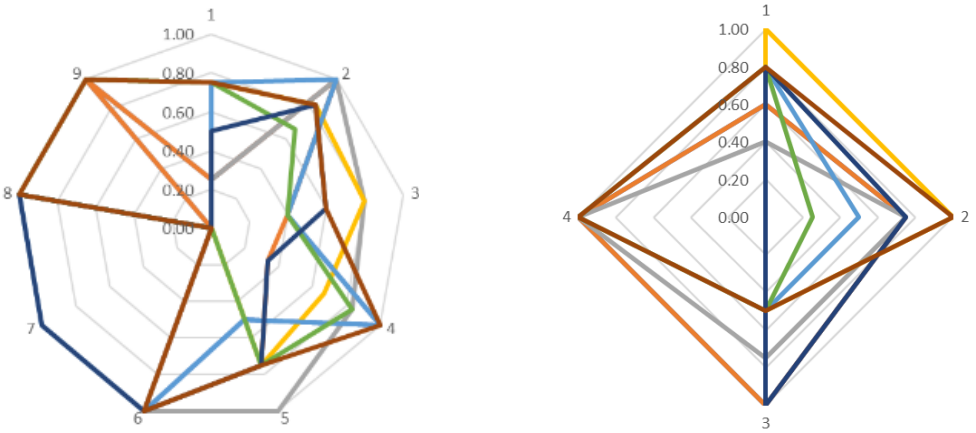
by some institutions in preparedness efforts and SLB Purworaharjo Gunungkidul has earthquake preparedness study materials.



a) b) c)

Fig. 19. The rose diagram of the teachers and employees of SLB Purworaharjo Gunungkidul's community capacity answers a) Knowledge, b) Attitude, c) Practice

According to Figure 19, the knowledge survey shows that all of the teachers and employees in SLB Purworaharjo Gunungkidul said that they know about natural disasters, but only 50% of them correctly answered the definition of natural disaster. The attitude survey shows that 88% of the teachers and employees have made competency standards, syllabi, and evaluations of earthquake study material. However, the practice survey stated that four out of eight teachers and employees knew about the disaster preparedness team and participated on the team.

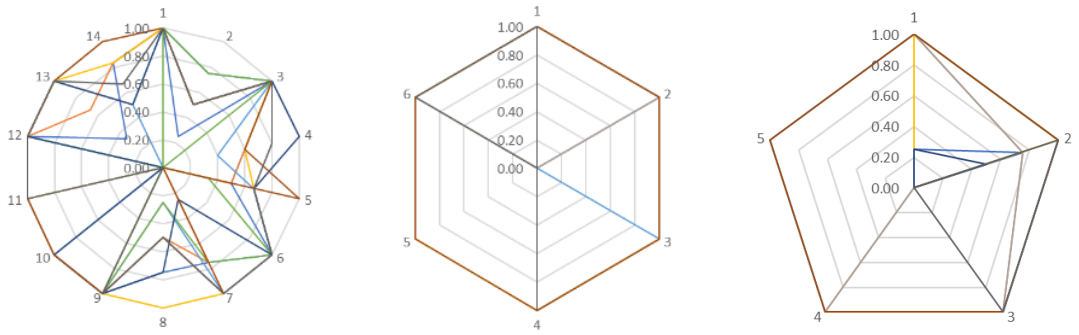


a) b)

Fig. 20. The rose diagram of the students of SLB Purworaharjo Gunungkidul's community capacity answers a) Knowledge, b) Attitude and practice

According to Figure 20, the knowledge survey shows that 90% of students in SLB Purworaharjo Gunungkidul answered correctly the definition of natural disaster. 75% of SLB Purworaharjo Gunungkidul's students have discussed their surroundings about earthquakes, and 25% of the students know that not every earthquake event caused a tsunami. However, the attitude and practice surveys show that 72% of SLB Purworaharjo Gunungkidul's students know what and how to do when an earthquake occurs.

According to Figure 21, the knowledge survey shows that 100% of SLB Purworaharjo Gunungkidul's committee said they knew the definition of natural disaster, but only 56% of them answered correctly. The attitude and practice surveys show that only 60% of the committee has participated in discussions with school members about disaster preparedness in SLB Purworaharjo Gunungkidul.



a) b) c)

Fig. 21. The rose diagram of the school committees of SLB Purworaharjo Gunungkidul's community capacity answers a) Knowledge, b) Attitude, c) Practice

The result of the community assessment using the KAP survey in SLB Purworaharjo Gunungkidul is shown in Table 12. According to the data in Table 12, the headmaster, teachers, and employees maintained a high level of capacity in dealing with earthquakes, whereas the students and school committee offered a moderate level of capacity (Roswanto, 2022).

Table 12. The assessment of community capacity of SLB Purworaharjo Gunungkidul

No	Category	Average preparedness index score	Preparedness category
1	Headmaster	92.25	High
2	Teacher and employee	86.04	High
3	Student	65.26	Moderate
4	School committee	64.21	Moderate

4. Conclusions

The infrastructure preparedness index scores of SLB Dharma Bhakti Piyungan, SLB Insan Mandiri Dlingo, and SLB Purworaharjo Gunungkidul matched the high category with index values of 88.55, 90.92, and 88.41, respectively. However, with this infrastructure preparedness index score of 78.26, the SLB Sekar Melati Muhammadiyah Imogiri showed a little degree of earthquake preparedness. Nevertheless, each special needs school needs to enhance the quality of its physical infrastructure. This may be accomplished by resolving difficulties such as mending walls and floors that have been damaged, acquiring fire extinguishers, and implementing other essential enhancements. Regular monitoring of the structural building is necessary, in addition to performing the retrofitting process. The primary objective of regular monitoring is to ensure the safety of the special needs school building for the community's teaching and learning activities.

The average community's preparedness index score of SLB Dharma Bhakti Piyungan (64.52), SLB Insan Mandiri Dlingo (60.11), and SLB Purworaharjo (76.94) is classified in the moderate capacity category in facing an earthquake. However, the average index score of SLB Sekar Melati Muhmmadiyah Imogiri's community preparedness is 56.92 and classified in the low-capacity category in facing earthquakes. Based on the assessment of the special needs school community capacity, it is evident that all of the schools evaluated need to significantly enhance their ability to effectively handle earthquakes. Possible measures include facilitating social interaction and conducting frequent drills to enhance earthquake preparedness among the special needs school community. This will ensure that in the event of an earthquake, individuals are well-informed and capable of taking appropriate actions to ensure their safety and the safety of others. Teachers and personnel should receive rigorous training to assist students with special needs. This is because the varying needs of students require different activities or assistance during the evacuation operation.

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Author Contribution
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